

**REMARKS**

This is a full and complete response to the Office action dated December 9, 2005.

All comments and remarks of record are herein incorporated by reference. Applicant respectfully traverses these rejections and all comments made in the Office action. Nevertheless, in an effort to expedite prosecution, Applicant provides the following remarks regarding the cited references.

**DISPOSITION OF CLAIMS**

Claims 12, 14-19, and 26-29 are pending in the application. Applicants have amended claim 12 to include the subject matter of claim 13. Furthermore, new claims 28 and 29 have been added with support found in the application on page 5, lines 7-13, lines 24-28, page 6, lines 1-4, as well as claims 14-15, and 17-18. Claims 14-19 have been amended to put in proper form. No new matter has been added.

Furthermore, claims 20-25 have been canceled, however, Applicants hereby reserve the right to reassert said claims in the present application, or in any continuation or divisional application, or as may be appropriate.

**CLAIM OBJECTIONS**

The Examiner objected to the abstract of the disclosure suggesting that “leaset” should be changed to “least.” The Examiner also suggested that a comma should be added after “medium” in line 5 of claim 12, and deleted after the 2<sup>nd</sup> instance of “medium.” Applicants have amended claim 12 according to the Examiner’s suggestions. Favorable action is hereby solicited.

**REJECTION UNDER 35 USC §102 AND §103**

Claims 12, 19, 26 and 27 stand rejected under 35 USC §102(b) as being anticipated by **Ruppel et al.**, US 5,821,390 (“**Ruppel**”). Claims 12, 19, 26, and 27 also stand rejected under 35 USC §103(a) as being unpatentable over **Ruppel**. Additionally, claims 12, 17-19, 26, and 27 are rejected under 35 USC §103(a) as being unpatentable

over **Groten et al.**, US 5,730,843, (“**Groten**”) in view of **Ruppel**. Applicants respectfully traverse these rejections.

Applicants wish to note that claim 13 was not included in the above mentioned rejections under 35 USC §102 and 35 USC §103. As claim 12 has been amended to include the subject matter of claim 13, Applicants respectfully assert that the above rejections are no longer applicable. Favorable action is hereby solicited.

REJECTION UNDER 35 USC §103 IN VIEW OF **WESTERMAN**

Claim 13-16 stand rejected under 35 USC §103(a) as being unpatentable over **Ruppel** in view of **Westerman**, US 4,894,205 (“**Westerman**”). Applicants respectfully traverse this rejection.

According to §103, in order to establish a prima facie case of obviousness, there must be (1) some suggestion or motivation to modify the references, (2) reasonable expectation of success and (3) the prior art reference must teach or suggest all of the claim limitations. See MPEP §2143

The Examiner alleges that **Ruppel** teaches a multitube reactor with a catalyst tube bundle arranged within an outer wall and can have 5,000 to more than 40,000 tubes. The Examiner indicates that **Ruppel** does not specifically teach that a tube ratio changes with tube bundle diameter, but however, contends that **Westerman** teaches that a ratio of tube spacing to tube diameter increases with increasing bundle diameter for a given tube spacing.

The portion recited by the Examiner in **Westerman** can be found in column 1, lines 52-55, and is as follows:

A multitube reactor for such processes will have a diameter of about 5 m and between about 5,000 reactor tubes with a diameter of about 45 mm to 15,000 reactor tubes with a diameter of about 25 mm.

Applicants respectfully assert that **Ruppel** in view of **Westerman** does not disclose or suggest all the limitations of the instant claims.

Specifically, Applicants respectfully assert that the cited portion of **Westerman** does not mention or refer to the transverse dimensions of the catalyst tube bundle. **Westerman** does not disclose or suggest that tube bundle dimensions or diameters are increased or decreased. In the portion of **Westerman** cited by the Examiner, reference is made to a reactor having an - unchanged – diameter of 5 m, but which is loaded with a tube bundle being made of 5,000 or 15,000 catalyst tubes, respectively. Applicants respectfully assert that in this example, the diameter of the tube bundle will also remain about the same, namely slightly less than the diameter of the reactor. There is no teaching or suggestion that transverse dimension of the tube bundle would increase or decrease. **Westerman** does not teach or suggest what the tube spacing should be.

Applicants respectfully assert that **Westerman** therefore merely teaches, at most, that within a given reactor, one will have to decrease the diameter of the catalyst as a greater number of tubes are employed. This does not disclose or suggest the claimed invention.

Furthermore, with regard to new claims 28 and 29, **Westerman** does not disclose or suggest that the ratio  $t/d_a$  rises in a range from 1.3 to 1.6 with an external diameter  $d_{RBa}$  of the catalyst tube bundle increasing from 4m to 12m for a catalyst tube bundle having an essentially circular cross section or a tube bundle depth  $d_{RBt}$  measured parallel to the flow direction of the heat transfer medium increasing from 1.3m to 4m for a catalyst bundle having an essentially rectangular cross section.

Applicants therefore respectfully assert that **Ruppel** in view of **Westerman** does not render the instant claims prima facie obvious. Thus, Applicants respectfully request that the 35 USC §103 rejection be withdrawn.

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**Conclusion**

Having addressed all issues set out in the Office action, Applicant respectfully submits that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,  
NOVAK DRUCE & QUIGG, LLP

A handwritten signature in black ink, appearing to read "J. W. Bryan", is written over the printed name.

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